

Claims

1. A desulfurization method comprising removing sulfur content from liquid hydrocarbon by use of a metallic desulfurizing agent, characterized in that the method employs desulfurization conditions satisfying the following formula (1):

$$1.06 \times P_{\text{ope}}^{0.44} < T_{\text{ope}} / T_{50} < 1.78 \times P_{\text{ope}}^{0.22} \dots (1)$$

(wherein T_{ope} represents operation temperature ($^{\circ}\text{C}$); P_{ope} represents operation pressure (MPa); and T_{50} represents a temperature per 50 percent recovered as determined by "test method for distillation at atmospheric pressure" stipulated in JIS K2254 "Petroleum products - Determination of distillation characteristics").

2. The desulfurization method according to Claim 1, wherein the desulfurization conditions satisfy the following formula (2):

$$1.19 \times P_{\text{ope}}^{0.35} < T_{\text{ope}} / T_{50} < 1.68 \times P_{\text{ope}}^{0.24} \dots (2)$$

(wherein T_{ope} , P_{ope} , and T_{50} are the same as defined in Claim 1).

3. The desulfurization method according to Claim 1 or 2, wherein the method employs no hydrogen addition.

4. The desulfurization method according to any one of Claims 1 to 3, wherein the metallic desulfurizing agent comprises a porous inorganic oxide and a metallic element including at least nickel (Ni) supported thereon.

5. The desulfurization method according to Claim 4,

wherein the metallic desulfurizing agent is a nickel-copper-based desulfurizing agent.

6. The desulfurization method according to any one of Claims 1 to 5, wherein the liquid hydrocarbon is one species selected from the group consisting of a gasoline fraction, a kerosene fraction, and a gas oil fraction.

7. A method for producing hydrogen for use in a fuel cell, characterized in that the method comprises reforming a liquid hydrocarbon which has been desulfurized through a desulfurization method as recited in any one of Claims 1 to 6.

8. The method for producing hydrogen for use in a fuel cell according to Claim 7, wherein the reforming is partial-oxidation reforming, autothermal reforming, or steam reforming.

9. The method for producing hydrogen for use in a fuel cell according to Claim 8, wherein partial-oxidation reforming, autothermal reforming, or steam reforming is performed in the presence of a reforming catalyst containing ruthenium or nickel.

10. The method for producing hydrogen for use in a fuel cell according to Claim 9, wherein the reforming catalyst contains manganese oxide, cerium oxide, or zirconium oxide.